CLAIMS

1. A method for marking codes on a beverage can tab structure comprising a plurality of tab body portions, each body portion having a surface with a coating that changes color or brightness to appear lighter when laser light is applied, the method comprising the steps of:

(i) applying an approximately round laser light onto a first location on the surface of a tab body portion to achieve a light-colored spot, the fluence of the laser being too low to cause vaporization of the coating; and

after the applying step (i), (ii) repeatedly applying the approximately round laser light onto other locations on the surface of the body portion of the beverage can tab structure to achieve other light-colored spots,

(iii) advancing the tab structure so that steps (i) and (ii) can be repeated for a next tab body portion,

wherein the applying steps (i) and (ii) are applied in less than 75ms and the laser light in the applying steps (i) and (ii) changes the color or brightness of the coating, thereby forming light-colored elements having a minimum characteristic dimension of at least 200 micrometers, the elements forming a two dimensional code that is readable by a wireless communication device; and

reading, within a process time target of approximately 50ms, the two dimensional codes marked on the tab body portion.

2. The method of claim 1, wherein each element is formed from a single spot.

3. The method of any of the preceding claims, wherein the steps of applying the laser light include employing a laser having a focal ratio of between approximately 40 and approximately 70, or between 45 and 65, or between 50 and 60.

4. The method of any of the preceding claims, wherein the code is no greater than 6 mm by 6 mm or not greater than 5 mm by 5 mm.

5. The method of any of the preceding claims, wherein the spots have an aspect ratio of no more than approximately 1.5, no more than approximately 1.3, or no more than approximately 1.2.

6. The method of claim 0, wherein a focal distance is greater than 225 mm or between 300 and 375 mm.

7. The method of any of the preceding claims, wherein the applying steps (i) and (ii) are applied in less than 65 ms to form the two dimensional code.

8. The method of any of the preceding claims, wherein the applying steps (i) and (ii) are executed without active focusing of the laser.

9. The method of any of the preceding claims, wherein the applying steps (i) and (ii) are the coating is black such the code has no quiet zone surrounding the code.

10. The method of claim 1 , wherein each element is formed from multiple spots, each one of the spots formed by a single application of the laser, each one of the spots being approximately round.

11. The method or any preceding claim, wherein the average diameter of the spots is at least 250 micrometers and no more than 400 micrometers, preferably at least 250 micrometers and no more than 350 micrometers.

12. The method or any preceding claim, wherein the code is defined by at least 12 elements by 12 elements and no more than 21 by 21 elements.

13. The method or any preceding claim , wherein the coating forms a dark border outboard of the two dimensional code.